

## **BAS Club Annual Dinner 2017**

### **President's Address**

I remember how outraged BAS Club members were at the 2012 AGM when it was revealed that the Natural Environment Research Council was attempting to merge the British Antarctic Survey and the National Oceanographic Centre to form a NERC Centre for Marine and Polar Research. What NERC did not anticipate was the strong reaction of the BAS Club members who wrote to the relevant Ministers of State and to their representatives in the House of Commons to draw attention to the excellence of and to the value of the research that BAS was actually doing. This engendered a keen interest in BAS both in the Commons and Lords, which has given rise to a major rise in funding. The figures are eye-watering to those of us that served under Vivian Fuchs, Dick Laws and David Drewry.

**£200 million** will be the cost of the *RRS Sir David Attenborough*.

This new vessel is longer and has a greater draft than the current BAS vessels so **£15 million** will be spent on building a larger wharf around the existing one at Rothera

**£26 million** was the cost of the Halley VI station and a similar sum has been spent relocating it 23km inland of its original site

**£3.4 million** has been spent extending and refurbishing BAS Cambridge Headquarters.

Then in January 2017, it was announced that the British Antarctic Survey will receive another **£100million** to modernise the facilities and buildings at Rothera, Signy, Bird Island and at King Edward Point.

In addition to this, the Minister of State for Universities, Science, Research and Innovation, Jo Johnson announced at the keel-laying ceremony for *RRS Sir David Attenborough* that the Government are investing **£1million** in a Polar Explorer Programme. The aim of the programme is to inspire the next generation of scientists, engineers and explorers. This will be done by engaging young people in schools across the country in the construction progress of the new ship.

Over the first 2 weeks of December, modern communications enabled 500 pupils from 12 different schools to question scientists and support staff about research, support and day to day living at Rothera Research Station. The ages of the pupils ranged from 8 to 20, and many of the teachers got involved too. The response was very good and one group of 8

year-olds were more excited about the phone call to Antarctica than they were about Christmas. **Eat your heart out Santa!**

Last year I mentioned the excellent film that the Horizon Program made about Peter Gibbs' return visit to Halley Bay. The program highlighted the need to move the Station. This summer season they returned to Halley to film the actual move. I hope you all saw it for it really did depict the tremendous achievement the move was. From the meticulous grooming of the 23 km 'road way' to the very very careful repositioning of each module, especial the 200 plus tons of 'Big Red' it made gripping viewing. Then sadly, the program ended with the news that the station personnel were to be evacuated and the station winterised and closed down over winter because of the uncertainties over a new crack that has appeared in the Brunt Iceshelf. Named the 'Halloween Crack', it is not one single crack but a series of finger-like fractures to the north of the relocated station. The largest crack became active in 2013 and is spreading at 1.7km per year.

On a brighter but not lighter note, some Halley research also made news during the year. For the first time the levels of carbon dioxide in the atmosphere above the station were measured as 400 ppm, which is way above the 280 ppm of pre-industrial levels. This level of CO<sub>2</sub> measured at Halley is indicative of world-wide levels...and it is still rising. The last time CO<sub>2</sub> was at this level in the Earth's atmosphere was about 3 million years ago, in the Pliocene – and global temperatures were 2 to 3 degrees centigrade higher than they are today! The Arctic was more than 10 degree centigrade higher, was much wetter and covered in forests. Evidence from the Antarctic suggests that the Ross Ice Shelf did not survive. Some climate models suggest that the West Antarctic Ice Sheet disappeared entirely. **Global sea levels were thought to be 25 metres higher than present levels.** The rate at which the level of CO<sub>2</sub> is rising today is much faster than it was during the Pliocene!!! **I wonder if Donald Trump is planning to copy King Canut when the sea laps at the White House.**

Although the oceanographic capabilities of the *RRS John Biscoe* were very limited compared to those of *RRS James Clark Ross*, the BAS Offshore Program did make a significant contribution to the international BIOMASS program the Biological Investigation of Marine Antarctic Systems and Stocks. BIOMASS led to the formation of CCAMLR, the Commission for the Conservation Of Marine Living Resources, whose mission is to provide scientific evidence and guidance to Governments and Policy makers. It was recently announced that a large portion of the

Ross Sea region has been designated a Marine Protected Area, keeping it safe from fishing and other human activities. Furthermore at the recent CCAMLR meeting agreement was reached to protect newly exposed areas of ocean that are being revealed under collapsing and retreating ice shelves. BAS has and continues to contribute significantly to the science that helps to ensure that these important ecosystems are protected from exploitation.

BAS is currently leading a new NERC 5–year, multi research centre program which will measure, understand and predict the circulation of the Southern Ocean and its influence on Global Climate. The Southern Ocean is unique in that it is where new waters are formed that sink down into the depths and old waters upwell from those depths to the surface. Consequently it is a major site for the drawdown of anthropogenic carbon and heat from the Atmosphere...hence its strong influence on global climate. BAS will be working in collaboration with the National Oceanography Centre, the British Geological Survey, Plymouth Marine Laboratory, the Centre for Polar Observation and Modelling, the University of St Andrews and the Meteorological Office. There will also be numerous international players. *RRS James Clark Ross*, *RRS Sir David Attenborough* and *RRS Discovery* will be involved as well as autonomous surface and underwater vehicles. The program has the acronym **ORCHESTRA** which is an abbreviation of **O**cean **R**egulation of **C**limate by **H**eat and **C**arbon **S**equestration and **T**ransports. Orchestra is closely linked with another NERC program **RoSES** – **R**ole of the **S**outhern Ocean in the **E**arth **S**ystem, which is attempting to understand the biogeochemical processes involved in the Southern Ocean carbon sink.

Autonomous underwater vehicles play a major role in oceanographic studies today. These instruments profile temperature and salinity over the top 2000 metres of ocean every 10 days. The latest to be deployed also measure a suite of biogeochemical parameters and some profile over 6000 meters of to the sea bed. Almost 4000 such instruments give almost global coverage. This year round and widely distributed coverage has transformed our knowledge of the top 2000 meters of ocean.

During the past year BAS has continued to invest in Unmanned Aerial Vehicles as well. The latest models have a range of over 1000 km, have an endurance of 14 hours and can carry a payload of 15 kg. These vehicles are only operated from Rothera and Halley and by staff who have attended a very intensive 4 – week training course. In future AGMs

I hope that I will be reporting on the programs on which they have been deployed.

The refurbishment of the BAS Cambridge Headquarters has included the construction of a new 5,400 sq ft two-story extension. The extension includes a 150 seater conference room, two 40 seater seminar rooms, four 8 – seater meeting rooms and an open plan office with 32 desk spaces. The extension is called the Aurora Cambridge Innovation centre. Its facilities will be available for hire to external users who have interests in common with BAS in climate change, stewardship of the environment and developing technologies for use in challenging environments. It is hoped to encourage greater external collaboration with industry, policy makers, non-governmental bodies and academia. I hope to reveal more in future.

But the cream that has completed the very rich cake of extra funding that has become available to BAS must be the news that the British Antarctic Survey Director, Professor Jane Francis, has been appointed **Dame Commander of the Most Distinguished Order of Saint Michael and Saint George**. I am sure that you will all wish to join the BAS Club committee in its sending of heartfelt congratulations to Dame Jane